Developing a national framework to support coastal local governments adapting to the effects of climate change

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Abstract

Most Australians live, work and play near to the coast, resulting in most housing and infrastructure being vulnerable to effects of climate change such as increases in extreme weather, sea-level rise and storm surge. The exposure of the Australian people, the economy and the environment, to the effects of climate change is increasing as the population continues to grow. The Australian Bureau of Statistics estimates that the Australian population will reach 36.8 – 48.3 million by 2061 (ABS 2012).

The National Climate Change Adaptation Research Facility (NCCARF) has received Commonwealth funding for three years 2014-17 to develop a decision support system for understanding coastal climate risk, particularly from sea-level rise and storm surge. The system is targeted at stakeholders seeking to take practical actions to prepare for and manage that risk. It will make use of national data sets and research outputs developed over the past 5 years by organisations such as CSIRO, Geoscience Australia and the Bureau of Meteorology and will include clear guidance on good practice and links to case studies. The system will be delivered as an internet-based Coastal Climate Risk Management Tool, which will ensure that guidance is comprehensive, integrated, easily accessible and, most importantly, can be shared within and between organisations, and not gather dust on shelves.

Developing a decision support system and ensuring that it meets the needs of stakeholders requires substantial stakeholder engagement throughout the process. A range of Advisory and Technical committees will be established to provide guidance and will include State and Local Government policy and technical expertise. There will also be substantial end user engagement opportunities, and training once the Tool is delivered.

1. Introduction

Most Australians live at or near to the coast. All levels of government, developers and managers of infrastructure, most businesses and the community are faced with dealing with the risks associated with a changing climate. There is an ever-increasing volume of advice, information and tools being made available, but little of this is integrated or delivered in a way that supports easy access and use, particularly for those stakeholders that are poorly resourced.

A major focus of the three-year program for NCCARF Phase 2 is the development of a Coastal Climate Risk Management Tool for understanding coastal climate risk, particularly from sea-level rise and storm surge. The Tool will be designed to help stakeholders take practical actions to prepare for and manage climate risk, and provide practical guidance on how to manage the associated physical, social and economic risks. It will make use of national data sets and research outputs that have been developed over the past five years by various organisations and will include clear guidance on good practice and links to case studies.

2. Making use of existing data

A major goal of the Tool will be to make practical use of the wealth of data produced in the last decade through the considerable investment of the Australian government. Building these datasets into a decision support system targeted at coastal policy and decision-makers seeking to manage the coastal zone under climate change and sea-level rise will enhance resilience and preparedness for the future.

Over the past five years, there has been significant Commonwealth Government investment in developing new data, tools and knowledge to support climate change decision-making in Australia. Much of this effort has been focused on the coast. Organisations such as NCCARF and CSIRO's Climate Adaptation Flagship have been at the forefront of developing new knowledge through research investment. NCCARF has also focused on developing the capacity of researchers to undertake highly applied adaptation research and of the end-user community to use this research (NCCARF 2013). Other organisations, such as Geoscience Australia, CSIRO, CRCs such as the Spatial Information CRC and the Antarctic Climate and Ecosystems CRC, have all developed important national data sets and tools. Some targeted investment by the Commonwealth has gone into piloting adaptation pathway planning by coastal decision makers (the CAPS Program), identifying and delivering case studies of good practice in adaptation (http://www.nccarf.edu.au/localgov/), and into supporting adaptation planning by natural resource management (NRM) groups. All this investment has produced a world-class array of information.

3. Overview of the Coastal Tool

There is a strong need for work to be done to enable end-users to understand and, where useful, access the wealth of existing information, guidance material, tools, case studies and data to support their decision making. NCCARF is undertaking a project to support coastal decision makers by scoping this wealth of information and extracting and integrating the useful components to build a decision support system, known at present as the Coastal Climate Risk Management Tool.

The project will draw on existing knowledge and some new analysis to address knowledge gaps to develop a Coastal Climate Risk Management Tool. The Tool will be national in scope, but will include access to sufficient information and knowledge to ensure that it is applicable for the range of climates and regulatory and planning

systems throughout Australia. It will focus on the needs of government, particularly at the local level, but will also be applicable to the needs of all stakeholders on the coast including NRM groups and coastal infrastructure operators.

The Tool will consider natural and built assets, and will be based on the needs of end users determined following significant stakeholder engagement including regular feedback received from the governance and advisory mechanisms. It will be designed to meet planning and decision-making needs in coastal areas of high biodiversity, of new developments and where substantial assets are already at some risk from coastal climate hazards.

4. Design of the Coastal Tool

The main features of the Tool, as conceived by NCCARF at the time of writing (November 2014), are outlined in Figure 1. However, a key feature of the development of the Tool is stakeholder engagement to ensure that the final product is useful and will be made use of. This being the case, this structure may change as stakeholder consultation proceeds.

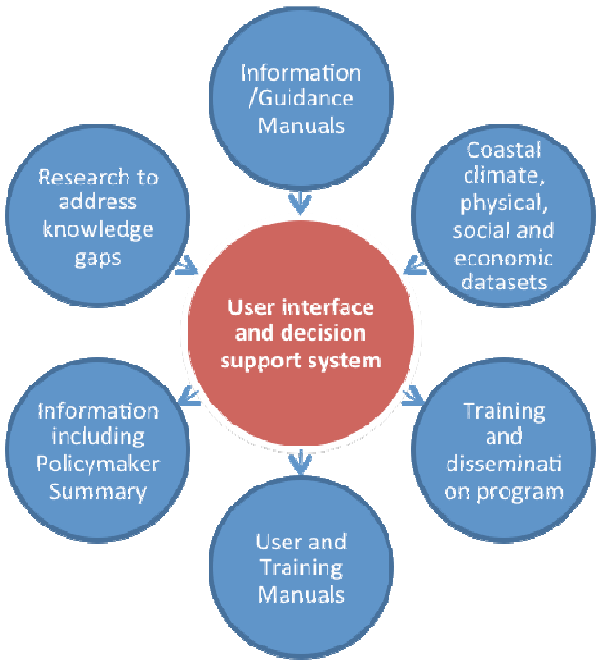

Figure 1: Provisional schematic representation of the links between the components of the Coastal Climate Risk Management Tool

The Coastal Climate Risk Management Tool will provide decision support for policy- and decision-makers in the coastal zone. It will be supported by a range of reference, information and training documents as well as by explanatory documentation. Although subject to stakeholder feedback, it is currently anticipated that the Coastal Tool will therefore have a number of constituent parts, as follows:

- A core User Interface including a rules-based decision support system, incorporating guidance through the Tool structure and evidence-based rules of thumb to provide support for decision making;
- Information/Guidance Manuals, including a State-of-Play Report on existing knowledge and resources, and guidance on accessing and using relevant datasets;
- Access to relevant climate, physical, social and economic datasets, which may be held off-site with links provided, or may be post-processed (where licensing permits) by NCCARF and made available on the decision support system website;
- Outputs from research commissioned to address knowledge gaps;
- User and training manuals;
- A Policymakers' Summary designed to publicise the Tool to a wider audience than the immediate coastal decision-making community.

The Tool will provide guidance on all aspects of adaptation planning in the coastal zone including but not limited to community engagement, risk assessment and adaptation options. It will be freely accessible with no cost implications to users. An on-line User Interface will provide access to all component parts of the Tool.

5. Delivering the Coastal Tool

Providing users with access to the best available science and leading advice and practice on coastal climate risk and sea-level rise, the Tool will be presented in ways that make the information accessible to and understandable by non-technical users. It will be underpinned by practical case studies and will be made available through the NCCARF website, and platforms such as Terra Nova. NCCARF will work to ensure high on-line visibility for the Tool.

To support uptake of the tools and associated products, NCCARF will deliver an intensive program of dissemination and will run a comprehensive program of training workshops.

While being voluntary in application, the final Tool will be endorsed by a Project Review Committee, the membership of which is in part drawn from all relevant States and Territories. This will ensure that it is consistent with State and Territory policies and legislation, thus supporting its use and application.

6. Conclusions

A significant challenge associated with the delivery of a Tool will be to support the needs of a diverse range of decision makers. Coastal local governments vary considerable in their exposure to climate change, in their capacity to access and use data and information, and in the scale of budgets available to them. Wealthy councils with strong capacity and access to excellent data and information collected at locally relevant scales may not require the information delivered through the Tool, but may find some of the guidance material and other products that are planned informative and useful and can use the Tool as a benchmark for assessing their approaches and for interacting with their communities. Others may find all aspects of the Tool useful for their purposes and enable them to begin the adaptation process.

A national scale decision support tool supported by all States and Territories will be a valuable resource for local government and will help to reduce uncertainty in the

choice of approaches to use. The need for such a resource has been strongly recognized by stakeholders for some time. The challenge for NCCARF will be to deliver a support system that meets the sometimes complex needs of practitioners and decision-makers while at the same time being attractive and straightforward in use.

References

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